



Non-Lethal Technologies for The Objective Force

Briefing for the NDIA Firepower Conference

***20 June 2001
Parsippany, NJ***

John Cline
TACOM-ARDEC
Com (973) 724-7317

Tank-automotive & Armaments COMmand
Committed to Excellence

MAJ Arthur J. Aragon Jr.
TACOM-ARDEC
Com (973) 724-6236

Report Documentation Page

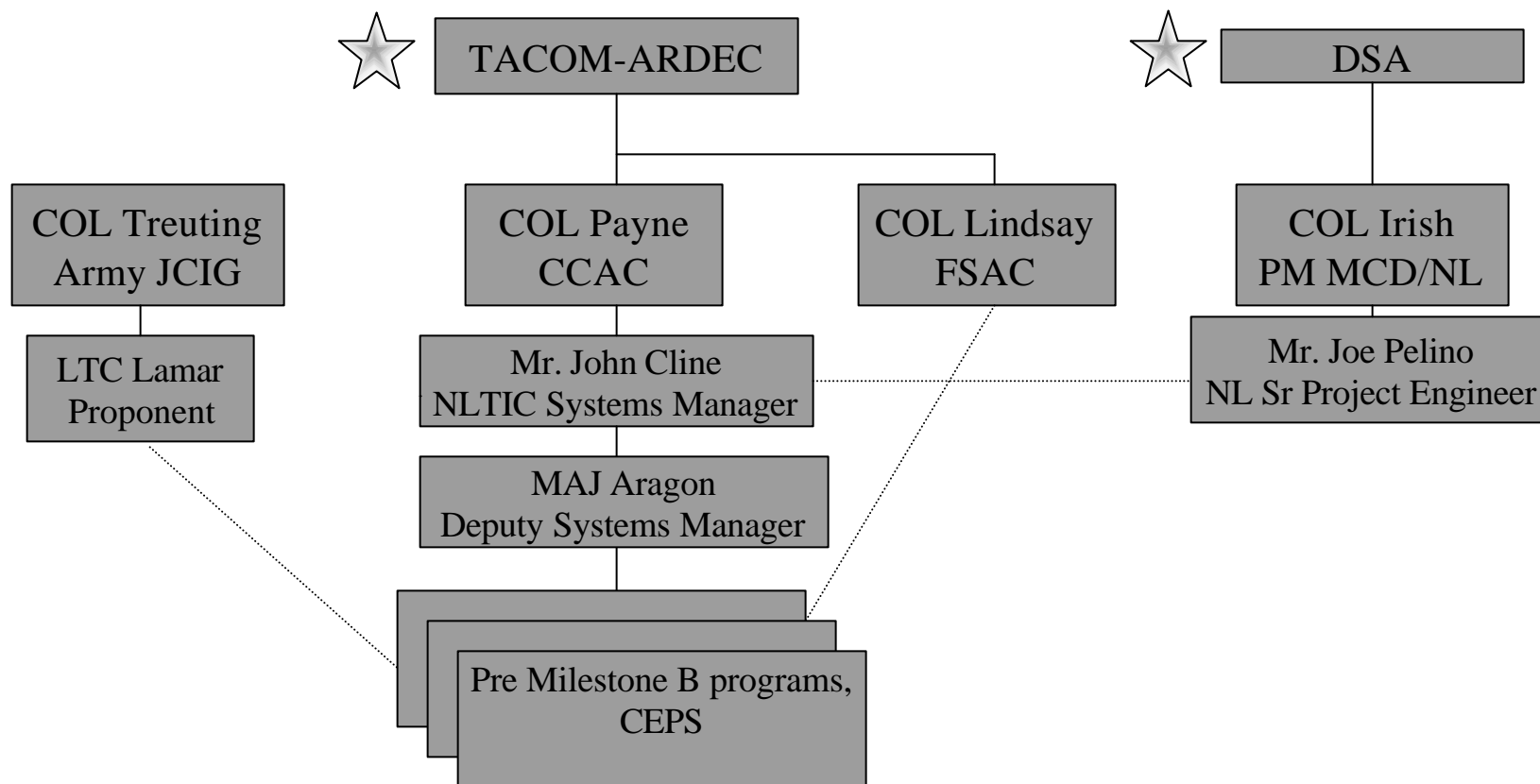
Report Date 20JUN2001	Report Type N/A	Dates Covered (from... to) -
Title and Subtitle Non-Lethal Technologies for The Objective Force	Contract Number	
	Grant Number	
	Program Element Number	
Author(s) Cline, John; Aragon, Jr., Arthur J.	Project Number	
	Task Number	
	Work Unit Number	
Performing Organization Name(s) and Address(es) TACOM-ARDEC	Performing Organization Report Number	
Sponsoring/Monitoring Agency Name(s) and Address(es) NDIA (National Defense Industrial Association 2111 Wilson Blvd., Ste. 400 Arlington, VA 22201-3061	Sponsor/Monitor's Acronym(s)	
	Sponsor/Monitor's Report Number(s)	
Distribution/Availability Statement Approved for public release, distribution unlimited		
Supplementary Notes Proceedings from Armaments for the Army Transformation Conference, 18-20 June 2001 sponsored by NDIA		
Abstract		
Subject Terms		
Report Classification unclassified	Classification of this page unclassified	
Classification of Abstract unclassified	Limitation of Abstract UU	
Number of Pages 27		

OUTLINE

- **Organization and Roles**
- **Army Lead Joint NLW Programs**
- **Army Proposed NL S&T for Future Combat System**
- **Conclusion**



Army NL Organizational Structure



US Army Roles in NLW



Single Proponent for U.S. Army Non-Lethal Applications



- The U.S. Army Military Police School (USAMPS, at Fort Leonard Wood, MO) designated single proponent for Army Non-Lethal Applications, effective 12 Sep 00.
- USAMPS will serve as the U.S. Army Training and Doctrine Command's single voice for all developments and initiatives to field NL capabilities.

U. S. Army Roles in NLW

(cont)



Project Manager for Mines, Countermine and Demolitions



- The Project Manager – Mines, Countermine and Demolitions (PM-MCD), located at Picatinny Arsenal, NJ, has program management responsibility for Army Non-Lethal Materiel Acquisition programs, and establishing the Army's Non-Lethal Capability Sets. PM-MCD sits on NATO LG 9 on Combat Engineering.



Systems Manager for U.S. Army Non-Lethal Technology Integration



- The Tank-automotive and Armaments Command - Armament, Research, Development and Engineering Center (TACOM-ARDEC), Close Combat Armaments Center (CCAC), located at Picatinny Arsenal, NJ, has responsibility for leading coordination of Army NL Technology development within AMC. CCAC sits on NATO LG 3, Close Combat Infantry.

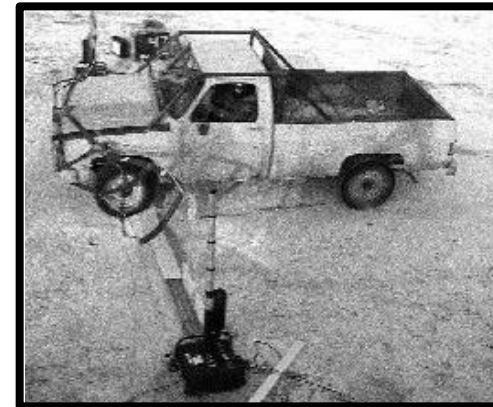
DoD Joint NLW Program

Legacy Army Lead Materiel Programs

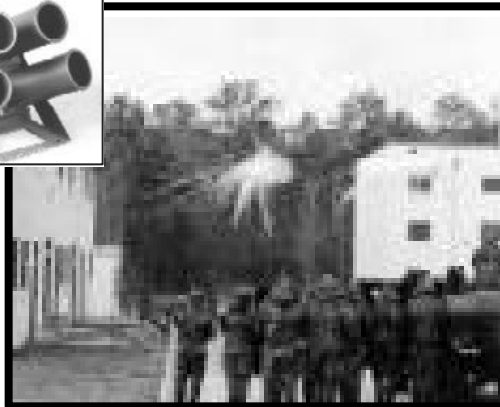


M5, Modular Crowd Control Munition (MCCM)

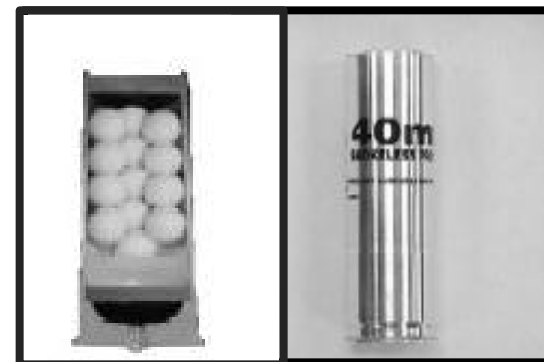
Army's 1st "TC-Std" NL Area Target Munition



M1, Portable Vehicle Arresting Barrier (PVAB)



66mm Vehicle Launched NL Grenades (XM98 Distraction, XM99 Blunt Trauma)

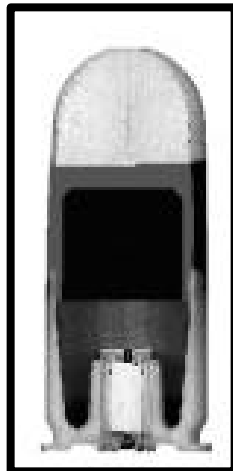


40mm NL Crowd Dispersal Cartridge (CDC), XM1029

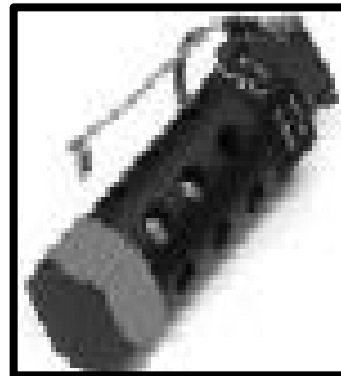


Army Soldier Enhancement Programs

**40mm M1006
Non-Lethal Cartridge
(Sponge Grenade)**

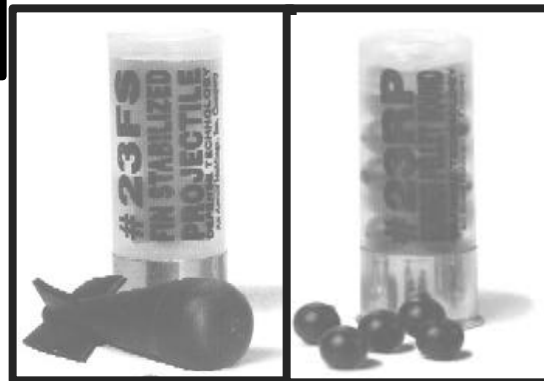


*Army's 1st
TC-Std NL
Point Target
Ctg*

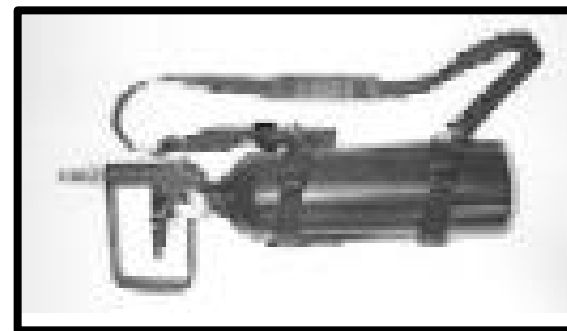


M84 Stun Grenade

**5.56mm XM95
Rifle Launched
Non-Lethal Munition**



**12 Gauge
Non-Lethal Munitions
XM1012, XM1013**



**M37 Mid Size
Riot Control Disperser**





Urgent Fielding to Balkans

STARS AND STRIPES

Volume 14, No. 286

SUNDAY, APRIL 9, 2000

75¢

Not your average weapon



Kosovo showdown led to historic use of nonlethal ammunition in field Page 3

In the military



Scottish refusal to allow PCR in
forwarded to the U.S. Army
to be deployed in the Balkans
first challenge it encountered. Page 2
A small state of Civil War veterans

In the military

weapons pack powerful

have never seen him
it said. 40 years ago
d be fired from the

With the increasing frequency
of peacekeeping missions being
handed to troops these days, the
army has had to use on a regular



The Miami-Dade County
police department's new
policy for the use of
that word. It is a 10-second to 15-second
to the United States' new
port. Page 2

while the concept didn't have
any to notice what happened to
the man, known, said he can
be silent.

"He can away with his hands in

ago Thursday. "The fears of
don't work as well. It just didn't
have enough punch. The soldiers
said they could literally see the
balls leaving the barrel."

ari,
on-
bank
ing
of



Kosovo
April 2000
Feb 2001

LTC Brown, Battalion Commander, Bn 709th (Task Force Falcon Provost Marshall)
***"Bottom line is that our new equipment works well and
the NLM kept us from having to kill someone as well."***

**Joint Non-Lethal Weapons
Program
US Army Lead Activities**

Why Non-Lethal?

DoD Directive 3000.3, 9 Jul 96 Policy for Non-lethal Weapons (NLW)

. . . **Designates** . . . Commandant of the Marine Corps
Executive Agent for the DoD NLW Program . .

. . . **Defines NLW** . . . “weapons that are explicitly
designed and primarily employed so as to
incapacitate personnel or materiel, while
minimizing fatalities, permanent injury to
personnel, and undesired damage to property and
the environment.”

. . . **Directs** . . . Services to participate in NLW program



DoD Joint NLW

Core Capabilities & Functional Areas

- Joint Mission Area Analysis (JMAA) -

DOD 3000.3: Policy for Non-Lethal Weapons - “NL Weapons are explicitly designed and primarily employed so as to incapacitate personnel or materiel, while minimizing fatalities, permanent injury to personnel, and undesired damage to property and the environment.”

Counter-Personnel*

- *Crowd Control*
- Incapacitate Ind'l Personnel
- *Denial of Area to Personnel*
- Clear Facilities & Structure of Personnel



Counter-Materiel*

- *Denial of Area to Vehicles*
- Disable/Neutralize Equipment



* Functional Areas / Tasks
Prioritized by all CINCs at
1996 DoD NLW User's Conference;
Joint Concept for NLW's
&
Per JMAA Jan 2000

Area Denial-Personnel CEP



Primary Mission Tasks

To deny an area to personnel in

- Urban/suburban environment
- Rural/open terrain environment

DESCRIPTION

- Joint NLWP formal Phase 0 CEP assigned to Army as lead
- Identify, develop, and evaluate alternative concepts that satisfy the requirements of Area Denial to personnel NL functional area. mission task
- Not limited to pre-emplaced systems or munitions

MILESTONES

- | | |
|----------------|-------------------------|
| • MNS approved | Mar, Oct 96 (USMC, USA) |
| • Milestone 0 | 3Q FY00 |
| • CRD | 1QFY02 |
| • Milestone B | 3QFY02 |
| • Milestone C | TBD |
| • FUE | TBD |

Crowd Control CEP



Primary Mission Tasks

- Contain or stop the crowd from advancing
- Disperse a crowd between 50-1000 meters
- Direct the crowd movement
- Isolate specific individual(s) within a crowd
- Separate Belligerents
- Disperse a crowd within 0-50 meters

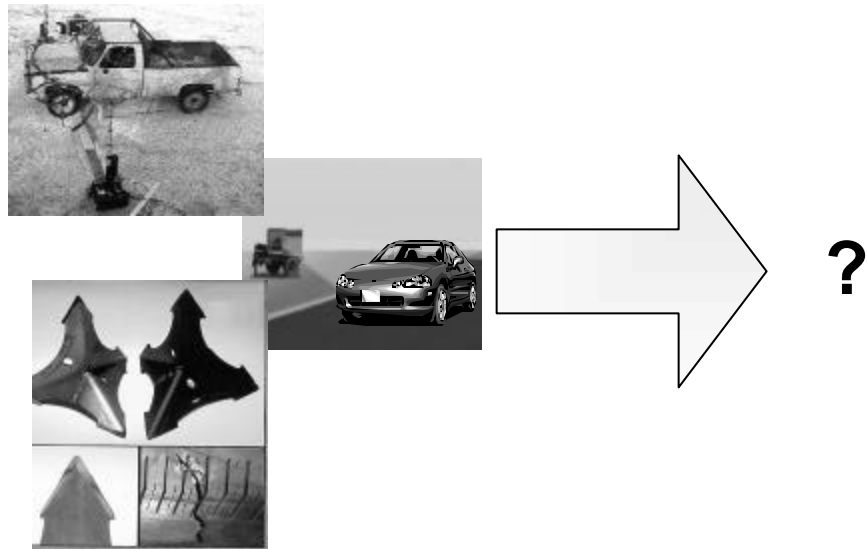
DESCRIPTION

- Joint NLWP formal Phase 0 (A) CEP assigned to Army as lead
- Identify, develop, and evaluate alternative system concepts that satisfy the jointly scoped mission tasks of the Crowd Control NL functional area
- Not limited to pre-emplaced systems or munitions

MILESTONES

- | | |
|-------------------------|---------------|
| • MNS approved | Oct 96 (Army) |
| | Mar 96 (USMC) |
| • Milestone A | 2QFY01 |
| • ORD to Staffing | 2QFY03 |
| • Mid-Phase A Dec'n Rev | 2QFY03 |
| • Milestone B | TBD |
| • Milestone C | TBD |

AD-V CEP



Primary Mission Tasks

- Deny an area to land vehicles
- Stop a vehicle-urban/suburban environment
- Channelize vehicles
- Stop a vehicle-open/rural environment

DESCRIPTION

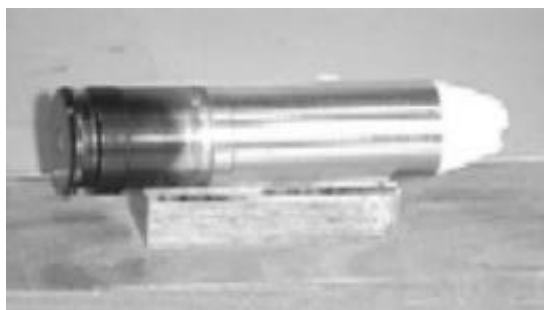
- Joint NLWP formal Phase 0 (A) CEP assigned to Army as lead
- Identify, demonstrate, and evaluate alternative concepts that satisfy NL Area Denial to vehicles mission task
- Not limited to pre-emplaced systems or munitions

MILESTONES

- | | |
|-------------------------|---------|
| • MNS approval | FY96 |
| • Milestone A | 2Q FY01 |
| • ORD to Staffing | 2QFY03 |
| • Mid-Phase A Dec'n Rev | 2QFY03 |
| • Milestone B | TBD |
| • Milestone C | TBD |

NL Airburst Round for OICW

JNLWP – Army Lead Pre-MS A Program



USER PAYOFF

- Counter Personnel or Materiel Payloads
- Range Determinant NL Airburst Capability
- NL Rd for M203 Replacement
- Maintains separate L / NL system capability

DESCRIPTION

- Joint NLWD program
- Non-kinetic NL Small Arms Capability
- Exploit the ability of airburst munitions to emplace or employ NL concepts.
- Capable of dispensing liquids, aerosols, powders, objects (post MS A)
- Scalable to other calibers / systems

MILESTONES

- | | |
|----------------|----------------|
| • MNS approved | Mar 96, Oct 96 |
| • Milestone A | 4QFY02 |
| • ORD approved | ----- |
| • Milestone B | 1QFY04 |
| • Milestone C | TBD |
| • FUE | FY09 |

Non-Lethal Mortar Round

JNLWP – Army Lead Pre-MS A Program



USER PAYOFF

- Long Range NL Capability
- Deployable from Existing Platform
- Potential Variable Payloads

DESCRIPTION

- Follow-on to Joint NLW TIP program (USA, USMC)
- Composite, Frangible, or Combustible Case Mortar Ctg, Electronic Fuze, Para- or Drag chute(s) for NL impact
- Payload TBD

MILESTONES

- | | |
|------------------------|----------------|
| • Service MNS approved | Mar 96, Oct 96 |
| • Milestone A | 2QFY02 |
| • Draft ORD | 1QFY03 |
| • Milestone B | 3QFY04 |
| • Milestone C | TBD |
| • FUE | TBD |

Ground Vehicle Stopper (GVS)

JNLWP – Army Lead Pre-MS A Program



USER PAYOFF

- Stand-off Vehicle (Engine) Stopper
- Low Target Effect Signature
- Potentially reversible target effect
- Non-barrier / Mobile

DESCRIPTION

- Joint NLW funded program (USA, USMC) Ground Vehicle Stopper (GVS)
- “Scaled Down Outdoor Demo” in FY01
- Vehicle Stopper system that acquires vehicles at standoff ranges without damage to occupants (or vehicle)
- Only Army led NL DEW system

*** JNLWP: “Technology Immature – Army S&T Needed”**

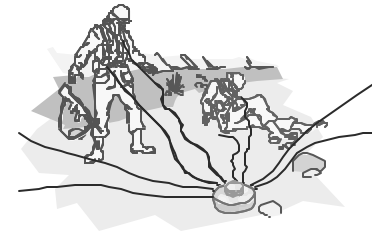
*Demo
Completed:
1 May 01
@ APG*

Technology Investment Programs (TIP)

JNLWP Army-Lead

- Taser (Electric Stun) Anti-Personnel Munition

ARDEC GDOTS (PRIMEX) Demo'd: 8 Mar 00



- Overhead Liquid Dispersion System

ARDEC GDOTS (PRIMEX) Demo'd: 8 Mar 00



- 81mm NL Mortar Rd*

ARL /ECBC UDLP Demo'd: 25 May 00



*** - *Follow-on Joint NLW, Army-lead, Program initiated in FY00: 2nd Demo in Apr 01***

- Malodorant Study & Cultural Ranking

SBCCOM/ECBC

Final Report: Sep 00



-NL Chem Payloads Front End Analysis

SBCCOM/ECBC

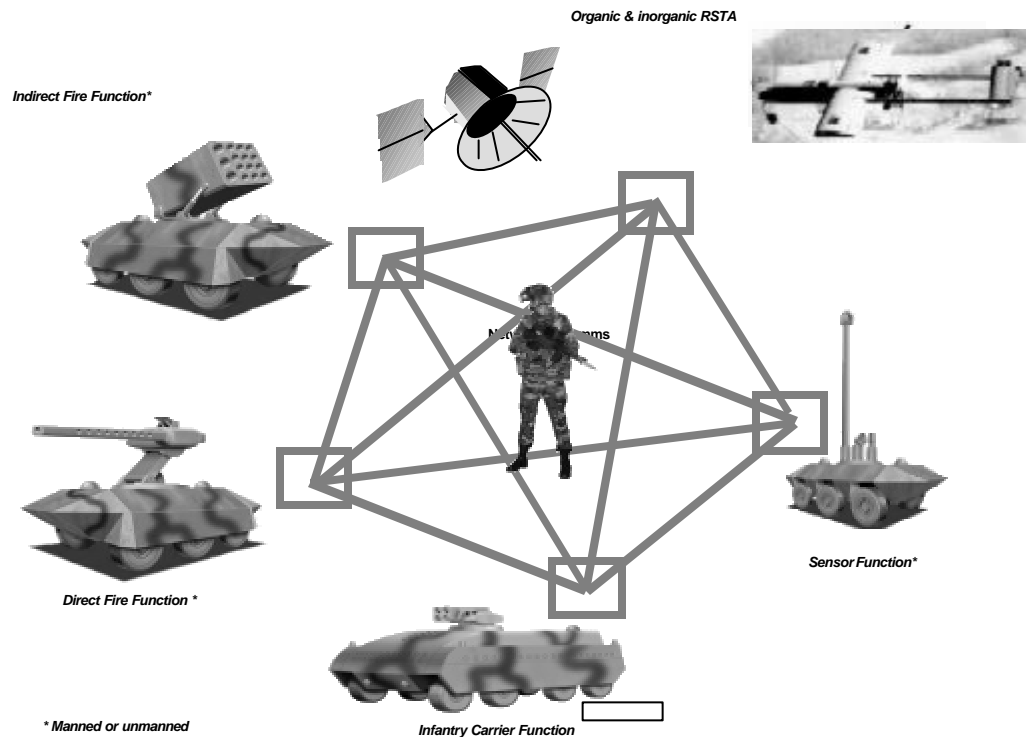
FY01 Start

**Non-Lethal Integration
into
Objective Force
and
Future Combat Systems**

Future Army Requirement Driving Need for NL Technology

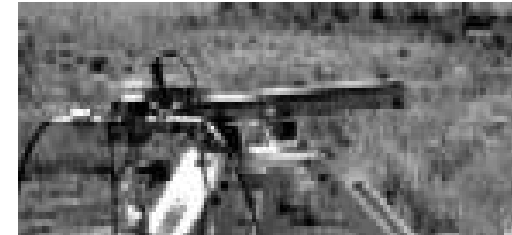
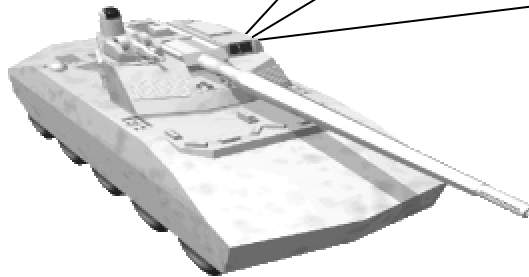
Future Combat Systems (FCS) Munitions/Armament

- Family of Systems for the Army Objective Force
- **#1 Army Modernization Priority**
- Mission Needs Statement: **FCS “will...include precision and non-lethal capabilities to minimize collateral damage.”**
- Army/DARPA funded development program
- FUE FY12

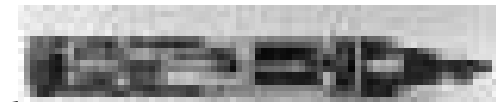


Potential Army NL S&T Opportunities for FCS

- **Aversive Audible Acoustics**
- **“NL Fires” Warhead / Payload Technology**
for:
 - Objective Force Precision
 - Area NL Effects
- **Non Lethal Counter Materiel**
 - RF-DEW



Non-Kinetic, Anti-Personnel
Delay, Deterrence, Aversion

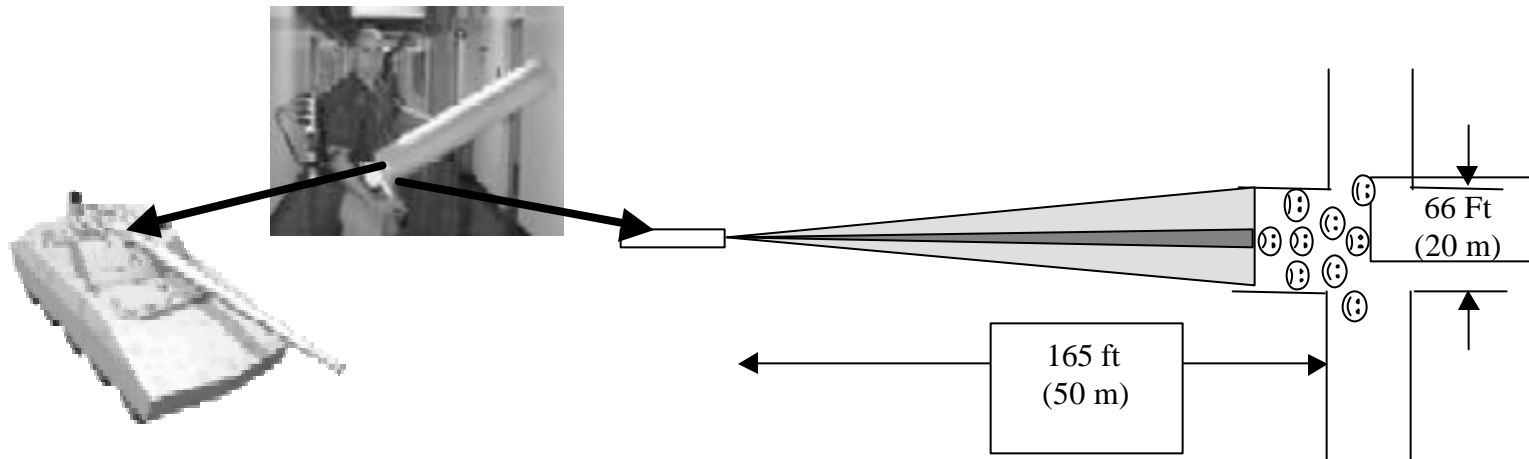


“Tunable fires”



Reversible Effect, Standoff
Vehicle Stoppers

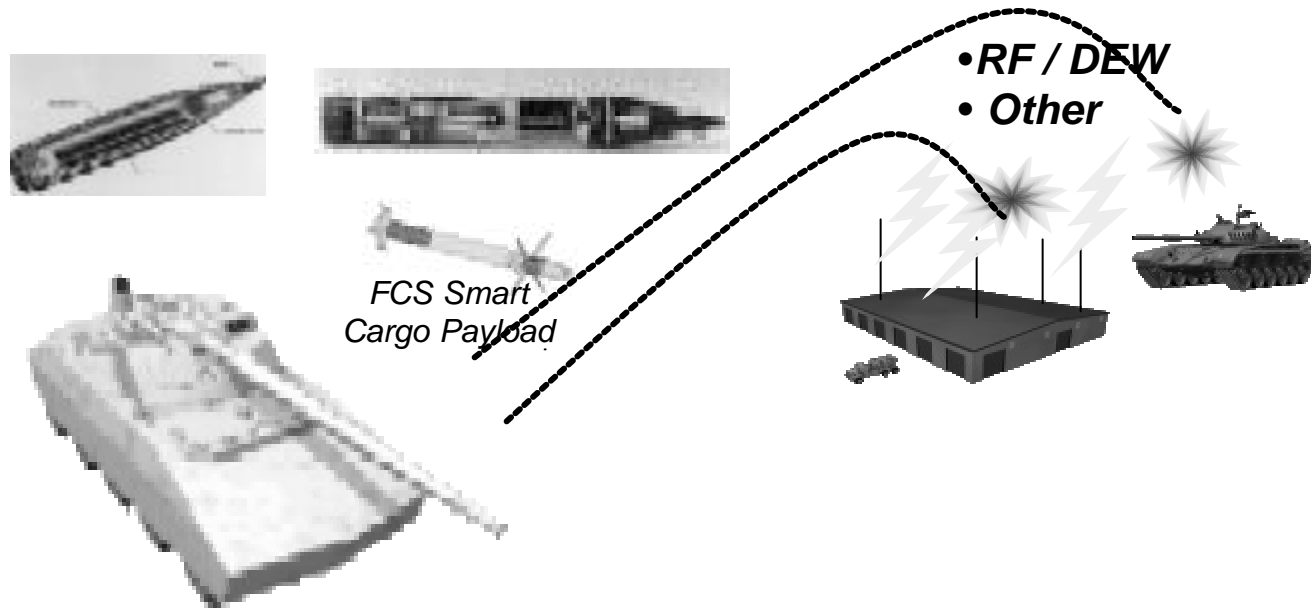
Audible Aversive Acoustic Device for FCS



DESCRIPTION:

- Vehicle Mounted or Hand-Held
- Sound Emission Below OSHA Standard for Permanent Hearing Damage
- Area Broadcast or Narrow Beam Modes
- Non-Kinetic, NL Counter-Personnel Device (“CNN Acceptability”)
- Aversive to Target with No Fatality / Injury
- Deep Magazine, Reduced Logistics (Rechargeable from Vehicle Power)
- Low Cost, Mounted / Dismounted Capability
- Engagement Range: 50 – 75m
- Environmentally Benign (No Clean-Up, No Energetic Materials)

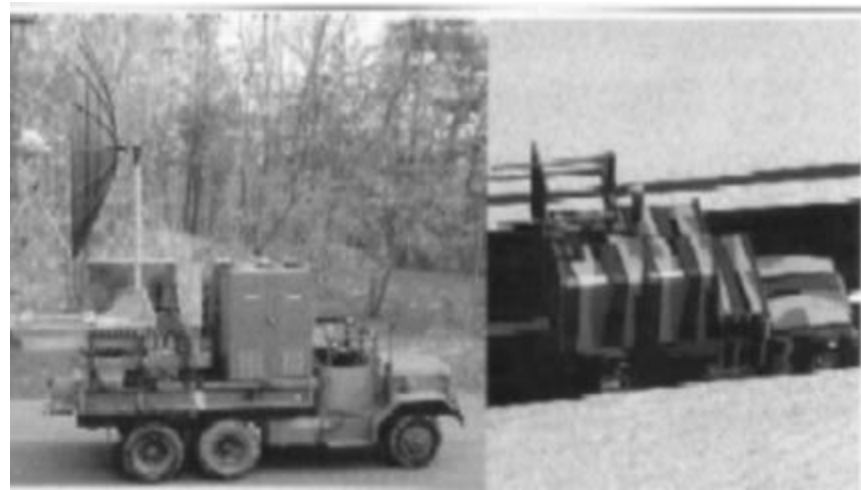
NL Fires Capability for FCS



DESCRIPTION:

- NL Counter-Materiel Capability for FCS Smart Cargo Rd
- Multi-Threat Capable (Electronic Components, Vehicles)
- 2 to 50 km Engagement Range
- Reduced Logistics Burden from Potential Selective Effect Munition
- Provide NL Counter-Materiel Payloads for Line-of-Sight / Beyond LOS Delivery from FCS Smart Cargo Rd

NL Multi-Mission Counter Materiel Capability for FCS

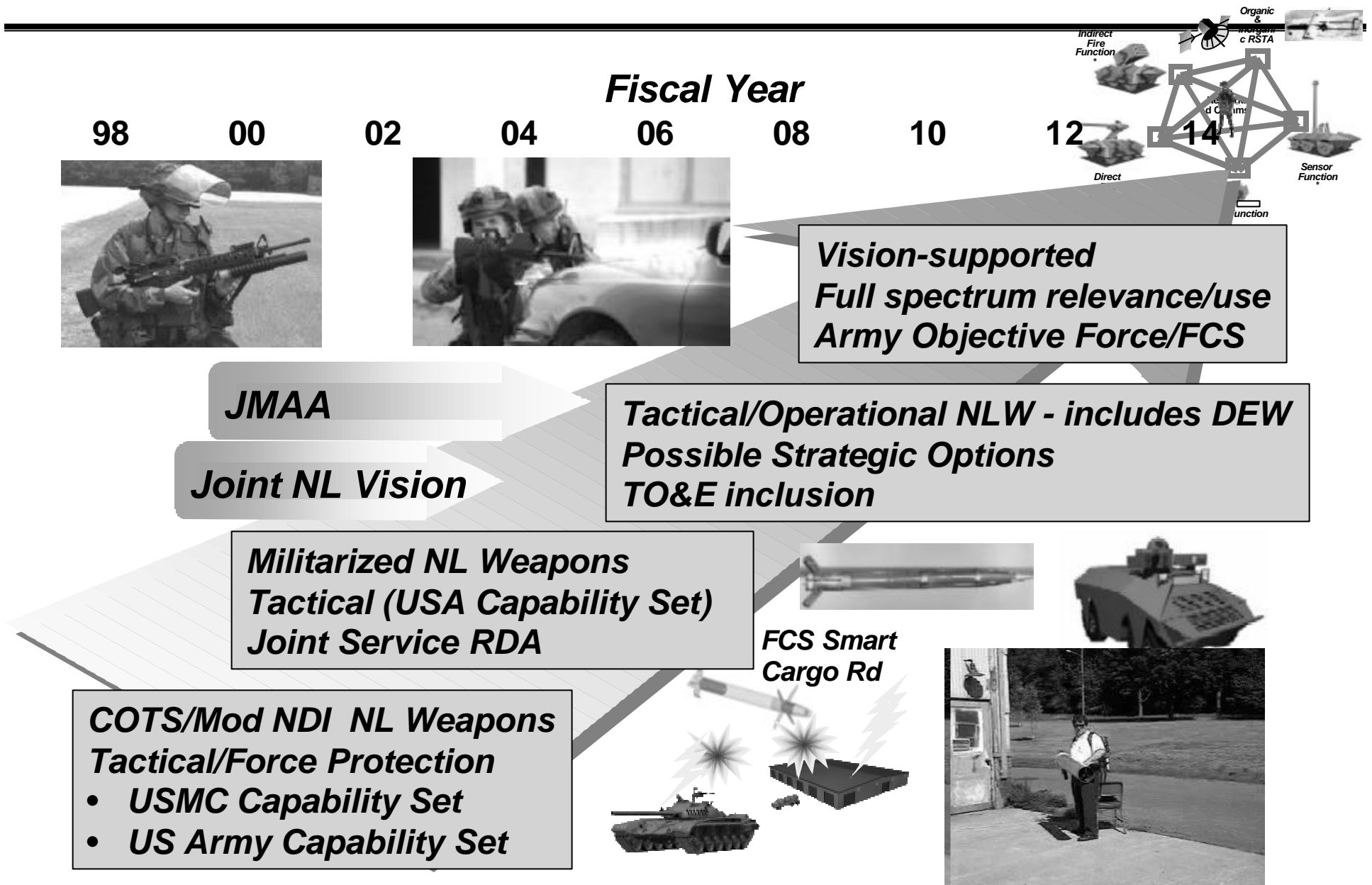


DESCRIPTION:

- Standoff Vehicle/Equipment Stopping Capability
- 250m to 500m Engagement Range
- No Fatality / Injury to Occupants, Bystanders
- Potentially Reversible Effects on Vehicles
- All Weather, Multi-Threat Capable (C4I, Vehicles, etc)
- Reduced Logistics Burden
- Rapid, Affordable Reuse



Future NLW Pathway



Conclusions

Develop technology for longer-range NLW

Invest Army S&T Funds in NL Capabilities for Future Combat System (FCS) & Objective Force

Integrate NLW Capability into the Objective Force

Provide Army with enhanced NL capabilities for FCS across the Full Spectrum of Conflict

Develop a True Rheostatic Weapon





Non-Lethal Technologies for The Objective Force